Chapter VI

ENGINEER OPERATIONS

1. Background

To succeed on a dynamic battlefield, the joint force and subordinate commanders must ensure the ability of the joint force to maneuver freely and to maximize the effects of its fires. At the same time, the joint force must deny the enemy that capacity. Engineers provide commanders with significant capabilities to assist in multiplying the battle effectiveness of both maneuver and fires.

2. Terminology

USMC doctrine recognizes four primary combat engineer functions: *mobility, countermobility, survivability,* and *general engineering.* The Army considers *topographic engineering* to be a fifth primary engineering function that supports the Defense Mapping Agency and all services as well. The following definitions of the four functions common to both services are provided to ensure clarity. The source documents for the definitions include Joint Pub 1-02; *Universal Joint Task List (UJTL);* and FMFRP 0-14.

a. Mobility. To provide freedom of maneuver for personnel and equipment on the battlefield/combat area without delays due to terrain or obstacles. Mobility is a quality or capability of military forces that permits them to move from place to place while retaining the ability to fulfill their primary mission.

b. Countermobility. To delay, channel, or stop offensive movement by the enemy in order to destroy its forces directly or indirectly by enhancing the effectiveness of friendly weapons systems.

c. Survivability. To protect personnel, equipment, and supplies from enemy and friendly systems and natural occurrences while simultaneously deceiving the enemy.

d. General Engineering. Intensive effort by engineer units that involves high standards of design and construction as well as detailed planning and preparation. It is that wide range of tasks in rear areas that serves to sustain forward combat operations.

3. DRB Operations

a. DRB Command and Control. The DRB deploys with its habitually associated engineer battalion. The mission of the battalion is to increase the combat effectiveness of the brigade by accomplishing mobility, survivability, and limited general engineering tasks. Based on METT-T analysis, additional engineer units can be requested from division, corps, and echelons above corps (EAC) to increase these engineer capabilities. The efforts of all engineers working in the brigade sector will be coordinated by the brigade engineer. The engineer battalion commander acts as a battalion commander and as the brigade engineer; the assistant brigade engineer serves as the commander's full-time representative on the DRB staff at the brigade TOC. Engineers advise the DRB and subordinate commanders and staffs on engineer unit capabilities and employment and on engineering impacts regarding respective unit plans and operations. Engineers also plan, coordinate, and supervise staff activities of assigned, attached, and supporting engineer units. The engineer battalion also provides a battalion task force command and control element for specific combat operations and can reorganize and fight as infantry when augmented with weapons and fire control elements. The battalion is most effective, however, when employed to perform engineering tasks in support of brigade and/or joint force operations.

b. Organization. The DRB engineer battalion consists of a HHC and 3 engineer companies (see Figure VI-1). The DRB commander normally task organizes forces with a supporting engineer company. However, METT-T may dictate that 1 or more companies be retained in general support of the brigade or placed in support of a particular task force to weight the DRB main effort. Table VI-1 provides a recapitulation of the organic DRB engineer battalion equipment.

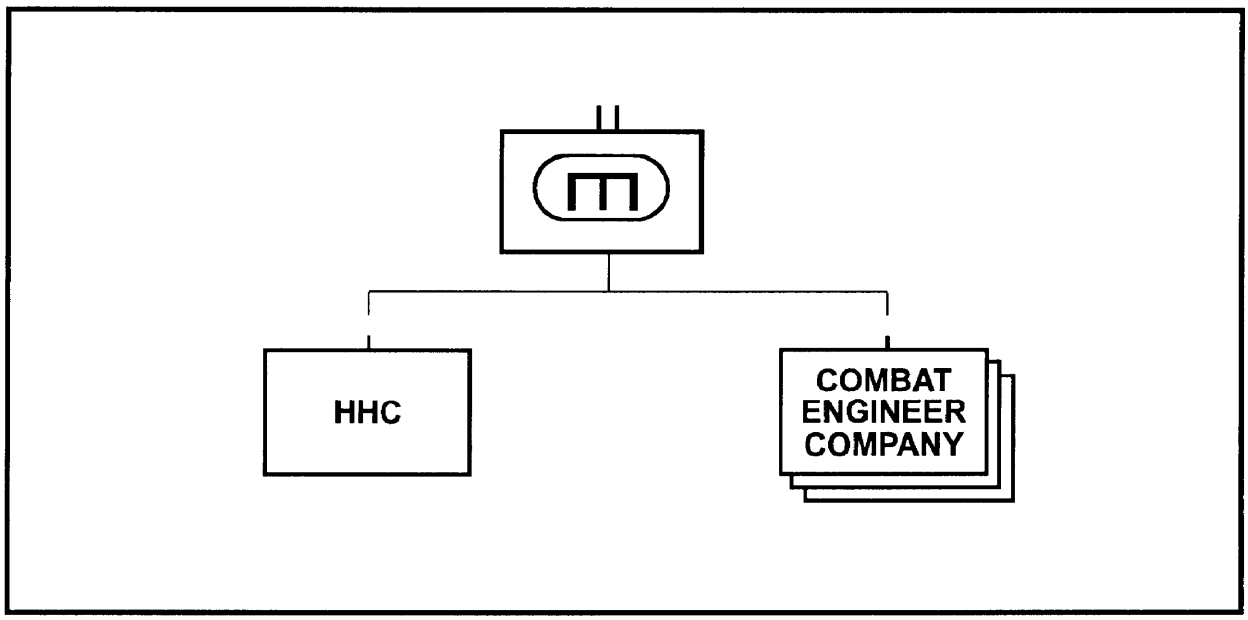

Figure VI-1. DRB Engineer Battalion

Table VI-1. DRB Engineer Battalion Equipment

TYPE EQUIPMENT	#	TYPE EQUIPMENT	#
M577 command post	6	Cargo (HEMTT)	8
Small equipment excavator (SEE)	6	Fueler (HEMTT)	4
Armored vehicle launched bridge (AVLB)	12	5-ton dropside cargo truck	3
Armored combat earth mover	21	2.5-ton cargo truck	11
Armored personnel carriers (M113 APCs)	28	1.5-ton trailer	26
Combat engineer vehicles (CEVs)	6	Maint contact TRK	3
Ammunition carriers (M548)	6	Wrecker, HEMTT	1
Mine clearing line change (MICLIC)	12	Shop equipment light truck	1
Volcano	6	HMMWV	27
Vehicle, tracked recovery (M88 heavy)	2	Mobile kitchen trailer Water trailer	2 4
Chemical agent alarm	18	Reconnaissance boat	7
Decontamination apparatus	1	Demolition set	24
Mine detectors	60	M60-series launcher	12
Radio sets AN/GRC/VRC/PRC 46/47/49/64/77/160	108	Radio set AN/GRC 106	1
Chainsaw	30	Carpenters tool kit (platoon and squad)	24

4. MEF (FWD) Engineer Operations

a. MEF (FWD) Command and Control. A MEF (FWD) may have as many as 4 separate engineer units as reflected in Figure VI-2. All of these units provide mobility, countermobility, survivability, and general engineering support based on size and capabilities. MAGTF engineer units' organization and equipment allow performance of a variety of missions and tasks in any environment. Engineer units of the MEF (FWD) are staffed, structured, and equipped to perform engineer assignments appropriate to their anticipated employment. The capabilities of given engineer units are largely dependent on the type and quantity of equipment they possess.

b. Command Element Engineer. The MEF (FWD) CE has an engineer officer on the staff. The engineer officer's duties are to advise and inform the MAGTF commander regarding the capabilities and best use of various engineer units within the MAGTF. The engineer officer provides CE level support, guidance, and coordination. A unit's normal capability is enhanced by tasking additional (or various) engineer units to reinforce.

c. GCE Engineers. Combat engineers organic to the GCE provide close combat engineer support by performing mobility, countermobility, and limited survivability tasks. They are integrated into combat formations and provided amphibious assault vehicle support or light armored vehicle transport to make them as survivable and mobile as the forces they are supporting. Combat engineers have the secondary mission to fight as infantry.

(1) GCE Engineer Organization. Normally, a reinforced company from the combat engineer battalion (CEB) of the Marine division supports a MEF (FWD) GCE as depicted in Figure VI-3. The CEB commander acts as a company commander and the GCE engineer. The CEB commander advises the GCE and subordinate commanders on engineer unit capabilities, employment, and operational impacts and plans and coordinates activities of attached and supporting engineer units.

(2) Equipment. Table VI-2 details some of the equipment assigned to an engineer company that supports a MEF (FWD) GCE.

d. ACE Engineers. Two assigned Marine wing support squadrons (MWSSs) support the ACE of a MEF (FWD). One MWSS normally supports the fixed-wing components of the ACE, while the other MWSS provides support to the rotary-wing component.

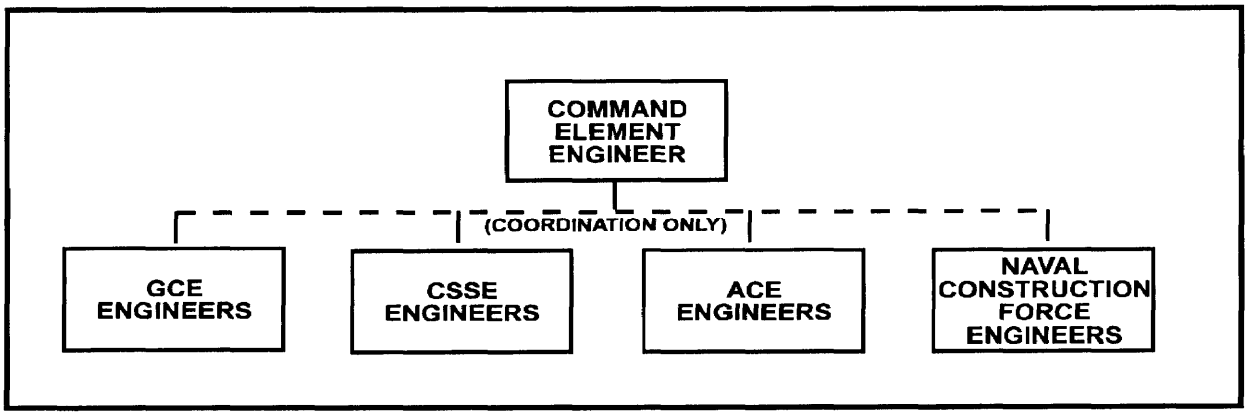

Figure VI-2. Notional MEF (FWD) Engineers

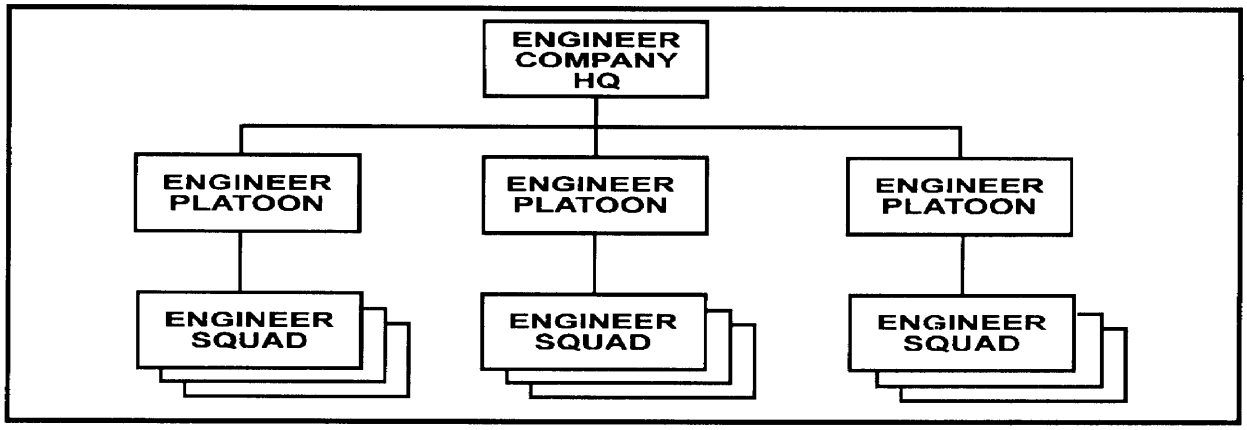

Figure VI-3. MEF (FWD) GCE Engineer Company

Table VI-2. Notional Combat Engineer Company (Reinforced) Equipment in Support of a MEF (FWD) GCE

NOMENCLATURE	QTY	NOMENCLATURE	QTY
AN/GRC 160	1	Chainsaw	9
AN/PRC 77	15	Carpenter kit	3
2 1/2 yd general purpose bucket	2	Pioneer kit	9
250 CFM	1	Armored combat excavator	2
Conventional mine laying system	4	T-5 bulldozer	2
Decon apparatus	1	D7G bulldozer	2
Demo kit	9	SEE tractor	3
Mine detector	9	TRAM	2
10k forklift	2	M923 5-ton truck	3
Line change/trailer	9	M929 5-ton dump truck	3
Minefield marking system	1	M998 HMMWV	12

(1) MWSS Organization. The engineer operations division of the MWSS provides the engineer capability (minus bulk fuel support) to the ACE as shown in Figure VI-4.

(2) MWSS Engineer Equipment. The table of equipment for the MWSS varies depending on which component of the ACE it supports, Engineers located in the airfield operations division receive, store, and dispense aviation and ground fuels. As directed, CSSE engineer assets may augment MWSS elements. Tasks include constructing vertical/short takeoff and landing sites, repairing, improving, and maintaining roads within the ACE tactical area of responsibility, shelter construction, and limited rapid runway repair, Tables VI-3A and 3B provide summaries of some of the engineer equipment available to the fixed- and rotary-wing MWSSs respectively.

e. CSSE Engineers. CSSE engineers are a reinforced company from the engineer support battalion (ESB) of the FSSG that normally supports a MEF (FWD) CSSE. This company provides general engineering support to the MAGTF. The engineer company commander acts as the company commander and the CSSE engineer. The engineer company commander advises the CSSE on engineer unit capabilities and employment and on engineering aspects of plans and operations. The engineer company commander also plans and coordinates the activities of attached and supporting engineer units. Figure VI-5 illustrates CSSE engineer organization. Table VI-4 recaps CSSE engineer equipment.

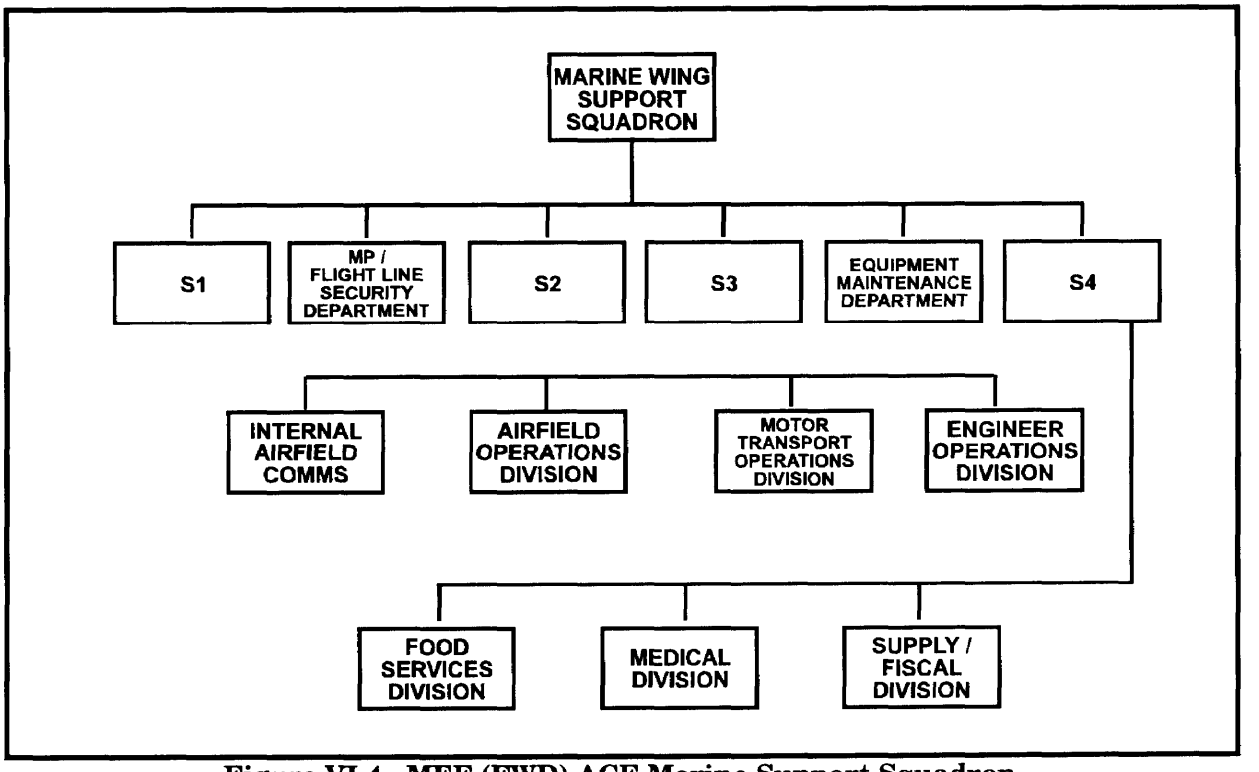

Figure VI-4. MEF (FWD) ACE Marine Support Squadron

Table VI-3A. MWSS (Fixed-Wing) Engineer Equipment (NAI)

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	5	Vibratory compactor roller	2
2 1/2 yd general purpose bucket	4	15 kw power distro system	10
5 CFM compressor	2	30 kw power distro system	4
50,000 lb container handler	2	100 kw power distro system	2
250 CFM compressor	2	Survey set	1
30-ton crane	2	3000 gal collapsible water tank	44
Drafting equipment set	1	T-5 bulldozer	2
Decon apparatus	2	D7G bulldozer	4
Chainsaw	5	Runway sweeper	2
Demo kit	1	MC 1150E tractor	2
Mine detector	2	644E tractor	9
Floodlight set	10	SEE tractor	2
Tactical airfield fuel dispensing system	6	Forklift extendible boom	12
Road grader	2	4000 lb forklift	6
Helicopter expedient refueling system (HERS)	2	Reverse osmosis water purification unit (ROWPU)	9
Excavator	1	Medium freshwater purification unit 3000 LMT	2
Field laundry	4	Water chiller	5
Light set (large)	3	Welding machine	2
Light set (small)	2	Petroleum testing kit	6
10,000 lb forklift attachment	9	3 kw generator set	12
SIXCON pump fuel module	4	10 kw generator set	5
Fuel SIXCON	18	30 kw generator set	14
350 cu ft refrigerator	11	60 kw generator set	6
Refrigeration unit	11	100 kw generator set	4
100 cu ft refrigeration unit	10	D7G ripper attachment	2

Table VI-3B. MWSS (Rotary-Wing) Engineer Equipment (NAI)

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	5	Vibratory compactor roller	2
2 1/2 yd general purpose bucket	4	15 kw power distro system	10
5 CFM compressor	2	30 kw power distro system	4
50,000 lb container handler	2	100 kw power distro system	2
250 CFM compressor	2	Survey set	1
30-ton crane	2	3000 gal collapsible water tank	44
Drafting equipment set	1	T-5 bulldozer	2
Decon apparatus	2	D7G bulldozer	4
Chainsaw	5	Runway sweeper	2
Demo kit	1	MC 1150E tractor	2
Mine detector	2	644E tractor	9
Floodlight set	10	SEE tractor	2
Tactical airfield fuel dispensing system	6	Forklift extendible boom	12
Road grader	2	4000 lb forklift	6
HERS	2	ROWPU	9
Excavator	1	Medium freshwater purification unit 3000 LMT	2
Field laundry	4	Water chiller	5
Light set (large)	3	Welding machine	2
Light set (small)	2	Petroleum testing kit	6
10,000 lb forklift attachment	9	3 kw generator set	12
SIXCON pump fuel module	4	10 kw generator set	5
Fuel SIXCON	18	30 kw generator set	14
350 cu ft refrigerator	11	60 kw generator set	6
Refrigeration unit	11	100 kw generator set	4
100 cu ft refrigeration unit	10	D7G ripper attachment	2

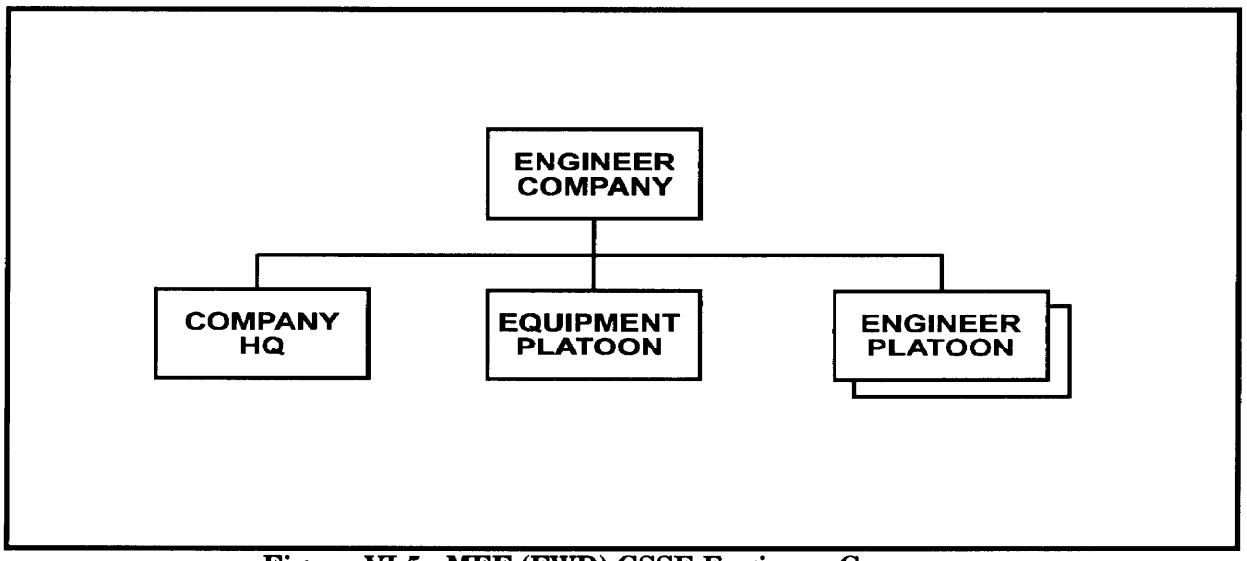

Figure VI-5. MEF (FWD) CSSE Engineer Company

Table VI-4. Notional Engineer Company (Reinforced) Equipment in Support of a MEF (FWD) CSSE

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	2	Assault trackway kit	10
2 1/2 yd general purpose bucket	3	D7G ripper attachment	1
250 CFM compressor	1	Chainsaw	9
Drafting equipment set	1	T-5 bulldozer	2
Conventional mine laying system	4	3000 gal collapsible water tank	17
Decon apparatus	1	D7G bulldozer	2
Demo kit	9	Water SIXCON	5
Mine detector	9	644E tractor	2
Floodlight set	2	SEE tractor	4
Armored combat earthmover	4	Carpenters kit	3
10,000 lb forklift attachment	2	Fuel SIXCON	3
3 kw generator set	15	Water purification set	2
10 kw generator set	2	Chainsaw	9
30 kw generator set	10	Forklift extendible boom	1
60 kw generator set	2	Water chiller	2
Line charge/trailer	9	Pioneer kit	1
Minefield marking system	1	ROWPU	2
Large light set	1	Medium freshwater purification unit (MFWPU) 3000 LMT	2

f. Naval Mobile Construction Battalion (NMCB). The NMCB of the naval construction force (NCF) normally supports a MEF (FWD). The NMCB mission is to provide highly skilled construction support to include—construction of ammunition supply points; airbases; ports; petroleum, oils, and lubricants (POL) storage and distribution sites; and storage facilities. NMCB units are neither trained nor equipped for close combat engineer support tasks such as obstacle breaching.

5. Integrated Engineer Operations

Tables VI-5A through VI-5D compare the engineering capabilities of both DRB and MEF (FWD) engineers regarding the four common primary engineering functions of mobility, countermobility, survivability, and general engineering.

Table VI-5A. Mobility Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
MOBILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Tactical recon	x	x	x		
Breach obstacles	x	x	x		
Combat roads/trails	x	x	x	x	x
Assault bridging	x	x	x		
Follow-on bridge construction			x		x
HLZ/DZ preparation	x	x	x	x	x
Improve beaches			x		x
Rapid runway repair			x	x	x
Unexploded ordnance disposal	x		x	x	

Table VI-5B. Countermobility Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
COUNTERMOBILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Tactical recon	x	x	x		
Construct log posts/cribs	x	x	x		
Construct abatis	x	x	x		
Wire obstacles	x	x	x	x	
Conventional mine emplacement	x	x	x		
Scatterable mine emplacement	x				
Road/runway cratering	x	x	x	x	
Bridge demolition	x	x	x		
Construct antitank ditches	x	x	x		x

Table VI-5C. Survivability Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
SURVIVABILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Construct fighting positions	x	x	x	x	x
Construct bunkers/C2 nodes	x	x	x	x	x
Assist in deception operations	x	x	x	x	x

Table VI-5D. General Engineering Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
GENERAL ENGINEERING TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Survey/drafting	x		x	x	x
Aircraft revetment	x		x	x	x
Bulk fuel			x	x	x
Water purification			x	x	
Field sanitation/hygiene			x	x	x
Tactical electric			x	x	x
Well drilling			x	x	x
Port repair					x
Forward operating base construction and maintenance			x	x	x
Mobile electric power			x	x	x
Expeditionary airfield construction				x	x

a. Planning Considerations. Coordinated engineer planning ensures that engineer combat resources support the scheme of maneuver, fire support plan, and combat service support plan. Common planning also ensures equipment compatibility, maintenance, and supportability.

(1) Offense. Planning considerations peculiar to the offense include—

(a) Engineer force mobility and integration into maneuver formations to ensure the momentum of the attack.

(b) Arrangements for breached lane handoff from forward breaching units to following engineers for lane improvement and obstacle clearing.

(c) Replacement bridges for armored launchers, follow-on tactical bridging, lift capability for line-charge reloading, and lane marking materials to replenish marking systems.

(d) Common lane marking system for breaching operations.

(e) Increased general engineering requirements as length of line of communications (LOCs) and CSS requirements increase. Plan on-call rapid mining and obstacle emplacement to protect flanks and disrupt enemy counterattacks. Assist in force protection from counterattacks once the force seizes objectives.

(f) Transition to Defense. Class IV and V materials require long lead times to obtain.

(2) Defense. Engineer planning considerations specific to the defense include—

(a) An obstacle system that not only attacks the enemy where desired but also assists counterattacks and facilitates future operations.

(b) Large amounts of materiel and engineer munitions that require time and transport to move.

(c) Early identification of critical engineer tasks. Terrain preparation requires time for completion. Engineers must be employed while planning is in progress.

(d) Engineer organization for combat that allows for rapid transition to offensive operations. The reserve must always have a designated force of engineers. Obstacles must not preclude friendly spoiling attacks or counterattacks.

(e) Engineer units remain committed and work on the commander's priority tasks. Although engineers are positioned with reserve forces, engineer units are not held in reserve.

(3) Retrograde. Specific retrograde engineer planning considerations include—

(a) Centralized control/decentralized execution. Increased numbers of reserved obstacles ensure successful passages of delaying forces.

(b) Obstacles that support weapon systems. Obstacles must not impede future mobility but support movement from battle position to battle position and placed in depth.

(c) Obstacle priorities to key choke points, delay positions, and flanks. The next consideration is developing obstacles directly assisting planned withdrawals to successive delay positions, generally along the delay positions. Special attention must be given to obstacles that cover flanks and lightly held areas to prevent surprise.

(d) Use of existing obstacles. Reinforcing obstacles must offer the best return for the effort invested.

(e) Deception integrated into planning effort.

(f) Designation of reserved demolition obstacle guard with an engineer firing party (or designated backup) to ensure destruction of critical targets, such as bridges along major avenues of approach, prior to enemy capture.

b. Considerations for Task-Organizing Engineers. Considerations for task-organizing available joint force engineer units include—

(1) Maneuver units without engineer support normally receive engineer companies in support.

(2) Support relationships are normally GS in the MEF rear and DS to committed maneuver units.

(3) Activities of engineers working in an area are coordinated by the brigade engineer regardless of the type of relationship.

(4) Engineer materials to support engineer operations are furnished by the supported unit regardless of command/ support relationship. Doctrinal logistical support responsibilities are defined in Table VI-6.

(5) Administrative/logistical support provided to attached engineer unit.

(6) Attached or OPCON engineer units further attached or placed OPCON to another engineer or maneuver unit or given a support relationship to a maneuver unit.

(7) The supported unit furnishing engineer materials to support engineer operations, regardless of command/support relationships. Table VI-6 defines doctrinal logistical support responsibilities and describes the inherent responsibilities associated with specific command and support relationships; these responsibilities guide operational planning and the employment of Army and Marine Corps engineer outfits.

c. Liaison Requirements. Constant liaison and reliable communications are

Table VI-6. Engineer Command and Support Relationships and Inherent Responsibilities

AN ENGINEER ELEMENT WITH RELATIONSHIP OF—	GENERAL SUPPORT (GS)	DIRECT SUPPORT (DS)	OPCON	ATTACHED/ ASSIGNED
Is commanded by—	Parent unit	Parent unit	Supported unit	Supported unit commander
Maintains liaison and communications with—	Supported and parent units	Supported and parent units	Supported and parent units	Supported unit
May be task organized by—	Parent unit	Parent unit	Supported unit	Supported unit commander
Can be—	Used only to support the parent force as a whole. May be given an area or a task assignment	Dedicated support to a particular unit. May be given task or area assignments.	Placed OPCON to other engineer/ maneuver units or made DS to brigades/MAGTFs or task forces.	Further attached OPCON or DS to brigades, MAGTFs, task forces, or retained GS.
Responds to support requests from—	Parent unit	Supported unit	Supported unit	Supported unit
Has its work priority established by—	Supported unit	Supported unit	Supported unit	Supported unit
Makes its spare work effort available to—	Parent unit	Parent unit	Supported unit	Supported unit
Forwards requests for additional support through—	Parent unit	Parent unit	Supported unit	Supported unit
Receives logistic support from—	Parent unit	Parent unit	Parent unit	Supported unit

necessary for integrated engineer operations. Liaison personnel—

(1) Advise supported commander of capabilities, limitations, employment, and status of supporting engineer units/assets.

(2) Exchange target lists/folders as required.

(3) Maintain/update status of obstacles, emplacement of conventional and scatterable minefield.

(4) Monitor/share intelligence on status of enemy units, capabilities, activities, to include enemy obstacles.

(5) Plan specific arrangements for breached lane handoff from forward breaching units to following engineers for lane improvement and obstacle clearing.

(6) Develop and implement a common lane marking system for breaching operations.

(7) Plan and coordinate engineer efforts for extensive obstacle emplacement well in advance of operations.

d. Reporting, Recording, and Marking Requirements. Emplacing units must report each obstacle and minefield, intent, (i. e., barrier or obstacle plan) initiation, and completion. Record both friendly and enemy minefield because of their lethality to both friendly forces and noncombatants. Records and reports impact upon current operations and post-hostilities' clearance operations. Reporting, recording, and marking of minefield must be accomplished by the guidance found in Joint Pub 3-15, *Joint Doctrine for Barriers, Obstacles, and Mine Warfare.*

(1) Reports.

(a) Conventional Minefield. Three reports govern minefield emplacement: Report of Intention, Report of Initiation, and Report of Completion. Transmit reports to the authorizing headquarters for integration with terrain intelligence. Fused intelligence products flow through intelligence channels.

(b) Scatterable Minefields. The speed and responsiveness of scatterable-mine employment require accurate, uniform, and timely reports. Emplacing units report all information on mine employment for dissemination to affected units. Reporting requirements apply to all service delivery systems. If scatterable mines are emplaced within a land force commander's boundaries, regardless of the location of the FSCL, the emplacing unit immediately disseminates a scatterable-minefield warning message (SCATMINWARN) to all potentially affected units. See Figures VI-6 and VI-7 for sample SCATMINWARN reports. The high potential for unexploded ordnance and concomitant fratricide and mobility degradation dictates timely warning during planning and execution phases.

LINE	MESSAGE
ALPHA	EMPLACING SYSTEM
BRAVO	AT YES/NO
CHARLIE	AP YES/NO
DELTA	# AIM POINTS/CORNER POINTS
ECHO	GRID COORDINATES OF AIM POINTS/CORNER POINTS AND SIZE SAFETY ZONE
FOXTROT	DTG OF LIFE CYCLE

Figure VI-6. Sample SCATMINWARN Report

LINE	MESSAGE
ALPHA	ARTY
BRAVO	YES
CHARLIE	YES
DELTA	ONE
ECHO	MB 10102935 500M
FOXTROT	081610Z - 081920ZOCT90

Figure VI-7. Sample SCATMINWARN Report for Artillery Mission

(c) Joint Minelaying Operations (MINEOPS). Use the MINEOPS report to detail the location, characteristics, and status of component minelaying operations. Use the same report to request, task, modify, report, plan, and approve minelaying operations.

(d) Obstacles Other than Mine. fields. Use the Sensitive Information Report to provide information on barriers and obstacles (other than minefield) that may have an impact on current planning or operations.

(2) Records. The following required records facilitate troop safety, future operations, and postcombat clearing operations:

(a) Conventional and Scatterable Minefields. Emplacing units prepare and forward minefield records for all conventional minefield emplaced using the Minefield Record Report format. Record unit defensive minefield on the Hasty Protective Minefield Record.

(b) Retention of Records. The JFC assumes responsibility as the command repository for all minefield reports and records.

(3) Marking.

(a) Conventional Minefields. Specify the methodology for marking conventional minefields-both friendly and enemy—in the overarching OPLAN/OPORD. Fencing minefield may be appropriate in both circumstances to protect the force.

(b) Scatterable Minefields. Ground forces mark ground-emplaced scatterable minefield using accurate positioning or survey data. Air-emplaced scatterable mines pose a particular challenge and involve inherent risk to the joint force. Units operating near such mines must know minefield emplacement times, self-destruction duration periods, and aim points or lateral boundaries of the safety zones. Units finding minefield mark and report them to protect follow-on forces.

(4) Enemy Minefields. Tactical units report any detection, encounter or knowledge of enemy minefield, or mining activities to higher headquarters using the fastest possible means.

(a) Spot reports provide the tactical commander the initial source of barrier, obstacle, and minefield intelligence.

(b) Transmit detailed information on enemy minefield through service components to the joint force headquarters using the enemy minefield report.

(c) Exchange information between components using the joint Mine Countermeasures Report (MCMREP). The

report provides the location and status of all mining operations, including breaching and clearing.

(d) Specify marking procedures in OPLAN/OPORD to define limits of breached path, lane, or gaps, as well as the boundaries of the mined area.

e. Unexploded Ordnance (UXO). UXO affects planning and execution of combat operations. Type of munitions employed, self-destruct times, and submunition density must be viewed with respect to the forces that encounter them. Joint Pub 3-0 states *"Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. Their forces may now be operating beyond an FSCL or may plan to maneuver on that territory in the future. Such coordination is also important when attacking forces are employing wide-area munitions or munitions with delayed effects."* Preventing undue constraints on movement of forces and maneuver elements require planning and reporting.

(1) Planning. The use of submunitions primarily has an impact on land operations. Close coordination between component commanders and the JFC is required before any use of submunitions by any delivery means. Planning considerations include—

(a) Preplanning, deconflicting, and coordinating with other components.

(b) Minimizing impacts of residual effects on friendly operations:

• Future use of current enemy controlled terrain including airfields/ airstrips.

• Dismounted operations required in the area (special operations forces, security operations, etc.).

• Availability of engineer/EOD support?

(c) Impact on terrain management:

• Will friendly troops transit/ occupy the area?

• Locations of proposed main supply route?

• Restricted areas—proposed logistics base sites.

(d) Communications requirements: Information requirements and availability of automation and communications equipment to rapidly disseminate information.

(2) Reporting. Just as units emplacing obstacles and minefields are responsible for immediate reporting of those obstacles and minefield, units should be responsible for reporting UXO hazard areas created through use of submunition ordnance. See Appendix C for UXO Spot Report format. Once reported, UXO hazard areas are treated as another minefield or obstacle. As such, UXO information requires processing, plotting, and disseminating to higher, lower, and adjacent units.